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## SECTOR COMPETITIVENESS FRAMEWORKS

### AIRCRAFT AND AIRCRAFT PARTS HIGHLIGHTS



Industry Sector  
Aerospace and Defence  
Secteur de l'industrie  
Aérospatiale et défense

Canada

**Sector Competitiveness Frameworks** are a new series of documents produced by Industry Canada in partnership with Canada's key industry stakeholders. Each framework will examine a major Canadian industry sector, and will be prepared in two volumes. *Part 1 — Overview and Prospects* focusses on the opportunities, both domestic and international, as well as on the challenges facing industry sectors in Canada. *Part 2 — Framework for Action* will be based on consultations with major industry stakeholders, following study and review of the *Overview and Prospects*.

The objective of the **Sector Competitiveness Frameworks** series is to seek ways in which government and private industry together can strengthen Canada's competitiveness and, in doing so, generate jobs and growth.

In all, some 29 industrial sectors will be analyzed. *Part 1 — Overview and Prospects* will be available for distribution in printed as well as electronic forms during coming months for the following industries:

Aircraft and Aircraft Parts  
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Electronic copies of *Aircraft and Aircraft Parts: Part 1 — Overview and Prospects* are available on the Internet at the following address: [http://strategis.ic.gc.ca/aircraft\\_and\\_aircraft\\_parts.scf](http://strategis.ic.gc.ca/aircraft_and_aircraft_parts.scf)

This Highlights document can be made available in alternative formats upon request.

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*Aussi disponible en français sous le titre : Points saillants sur les aéronefs et les pièces d'aéronef.*

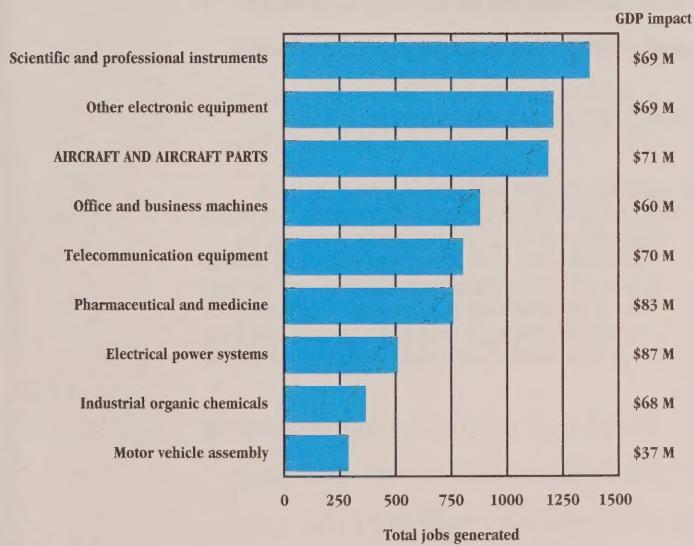


## HIGHLIGHTS

**Canada has developed a vibrant, internationally competitive aircraft industry that is a significant contributor to the Canadian economy.**

- Employment: 40 000 highly paid, high-quality jobs in 200 plants.
- Annual shipments: over \$5 billion.
- Annual exports: over \$4 billion.
- Canada's aircraft trade has shown a consistent positive balance in the 1990s.
- Among high technology sectors in Canada, the aircraft industry is a leading generator of jobs and national income.
- The industry is a leading investor in research and development (R&D).

**Impact of a \$100-million Increase in 1990 Output of Selected Canadian High-tech Sectors on Employment and GDP**



Source: Industry Canada estimates based on a special tabulation by Statistics Canada.

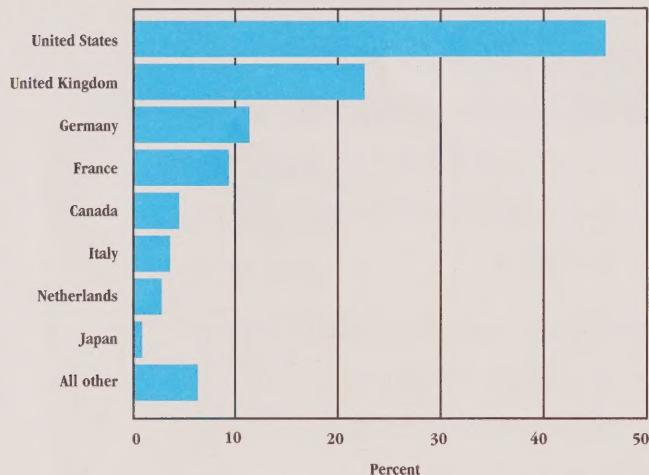
**The Canadian aircraft industry produces a diversified range of high technology products focussed on commercial export markets.**

- Complete aircraft include Bombardier's Canadair Regional Jet, the Challenger business jet, the de Havilland Dash 8 family of turbo-prop transports and civil helicopters from Bell Helicopter Textron Canada.
- Major subsystems include Pratt & Whitney Canada's line of aircraft engines and landing gear systems from Messier-Dowty, Menasco and Héroux.
- Major structural components for large jets are produced at Boeing Canada (fuselage and wing sections) and McDonnell Douglas Canada (complete wings).
- Numerous smaller firms supply parts and services for the major manufacturers.
- The sector also includes extensive repair and overhaul activities for airframes and aeroengines.

**Canada is one of only a handful of nations with firms operating successfully at all levels of the international industry.**

- Canada is the fifth largest exporter of aircraft and aircraft parts.

**Average Export Shares, by Country, 1980–92**



Source: Industry Canada estimates taken from Statistics Canada's World Trade Database.

- Canadian aircraft and engines are in daily operation around the world.
- Canadian-designed subsystems are employed in civil aircraft produced by North American and European manufacturers.

**Aircraft manufacturing is a truly global industry.**

- Major manufacturers rely upon an international network of designers and manufacturers of subsystems and major structural components.
- Trade in aircraft and parts among leading producing nations has been tariff-free since 1979 under the General Agreement on Tariffs and Trade.
- Export sales are crucial to most aircraft programs; no domestic market is large enough to be the sole customer for an aircraft manufacturer.
- The international industry is dominated by large aerospace and defence conglomerates whose production facilities are concentrated in their home nation. Many leading design and manufacturing operations in the Canadian industry are subsidiaries of these conglomerates.
- Aircraft markets are extremely volatile.
- Product design and development require daunting up-front investments that can be recouped only over a successful 15- or 20-year product life cycle in uncertain global markets.

**Aircraft manufacturing is a high-risk, “bet the company” business.**

***Product technology is a key driver, and is jealously guarded by competitors.***

- Proprietary products demand constant reinvestment in R&D.
- Aircraft and aircraft subsystems embody state-of-the-art technologies such as advanced materials and computerized controls.

***Manufacturing is low volume, and final assembly is complex and labour intensive.***

- Because of the relatively low production volumes, there is less room for process automation than in other manufacturing sectors.
- The complexity of the aircraft and aeroengine assembly operation requires highly skilled workers and yields important learning economies as the work force accumulates experience in assembly and integration tasks.
- Despite recent improvements in the organization and management of the production process, there is still room for significant cost reduction.

***Government intervention is pervasive; governments act as owners, financiers and customers of the international aircraft industry.***

- Governments are attracted by the industry's strong links to national defence and sovereignty issues and its contribution to national prestige.

- Governments also covet the aircraft industry's role as a generator of highly skilled jobs and export earnings, and as an incubator for R&D investment.

- The Canadian aircraft industry is much less dependent on sales to its domestic government than are its leading competitors.

***Overcapacity continues to plague the international industry.***

- Market volatility results in periods of low capacity utilization and widespread work force reductions during each business cycle.
- Recent declines in defence markets have accelerated industry restructuring and rationalization; further consolidation is expected.

***Important trends in the international environment are forcing established manufacturers to alter the way in which they conduct their business.***

- Military and commercial customers are increasingly cost-conscious; while performance improvements are still expected, the competitive edge now goes to those manufacturers who can also deliver lower life cycle costs and attractive sales financing packages.

- New competitors are emerging from Asia Pacific and eastern European nations. These aspirants can often provide lower labour costs, new investment capital, competitive technologies and/or enhanced access to growth markets.

***The industry is placing increased emphasis on reducing its cost structure.***

- Leading manufacturers have adopted more efficient design and manufacturing systems and processes, and have insisted that their suppliers do likewise. These have greatly reduced the design and development cycle time and the production cycle time.
- Firms are reducing the number of suppliers with whom they contract directly, partly by contracting for more complete subsystems that require the suppliers to manage more extensive supplier networks of their own.
- Suppliers are forced to bear additional inventory carrying costs, since they are now paid for their outputs only upon delivery of the completed aircraft.

***Major firms are expanding their use of risk-sharing arrangements with partners and suppliers.***

- Suppliers are being asked to take on more extensive design and integration responsibilities.
- Subsystem and subcomponent development costs, which used to be recouped upon delivery of the first certified product, now must be amortized over a long period of uncertain aircraft deliveries.
- Up-front “participation” fees are being demanded of suppliers who want to secure a position on an aircraft program.

***International collaborative efforts are an increasingly common method of sharing technologies, financial burden and market risks.***

- International partnerships sometimes improve access to otherwise restricted markets.

**World aircraft markets are in the midst of a cyclical recovery, and strong growth is expected over the long term.**

- Airlines have regained profitability after several disastrous years during the recession of the early 1990s.
- Most recently, airline capacity has not kept pace with growth in air travel, and orders for new aircraft are expected to strengthen.
- In the longer term, strong real income growth, particularly in the heavily populated Asia Pacific and Latin American regions, more liberalized trade and increased international business collaborations are likely to translate into strong growth in air travel.

**The Canadian industry is well positioned for the future.**

- Leading firms have maintained continuous investments in R&D of a diversified array of proprietary products.
- The industry has a civil and export-oriented market focus.
- The Canadian industry is close to, and integrated with, U.S. markets and industry.
- A skilled and experienced work force has been developed.

- Canada provides supportive government programming focussed on product development.
- A number of companies have already begun to respond to world industry trends by implementing cost-effective design, production and management techniques aimed at developing more efficient product at a lower cost.
- Some Canadian firms are also reducing their development costs and risks by entering into new partnership agreements with international suppliers and partners.

**Some Canadian companies remain vulnerable to the changes in the world industry, given that they:**

- operate on simple, build-to-print capability and manufacturing technologies that are readily available to competitors globally
- are foreign-owned firms with a truncated product mandate and little corporate autonomy to raise capital and seek business outside the parent corporation
- lag in the adoption of new processes and, in particular, still have operations based on serving a more overhead-laden military environment and/or
- are narrowly focussed with regard to export markets and international business relationships.

## THE BOTTOM LINE

**To maintain and improve its share of the world market the Canadian aircraft and aircraft parts industry must:**

- maintain R&D investment to support the development of competitive new products
- continue to improve productivity and reduce costs through the improvement and/or application of manufacturing technologies and processes
- create new and expanded international business relationships
- be prepared to adjust to lower levels of procurement by the Department of National Defence as well as to increasing customer demands for commercial-standard products.

**Improved human resources management is a key to improved competitiveness.**

- Adopting new managerial techniques, shop floor skills and new ways of organizing people and work will require more cooperative labour-management relations.
- Stakeholders will also have to deal with shortages of workers with informatics-related skills as new production technologies diffuse throughout the workplace.

**Government support for technology development and market access will continue to be crucial in order to level the international playing field.**

- Industry Canada recently announced the Technology Partnerships Canada (TPC) program and the Technology Road Map initiatives designed to support the competitiveness of the Canadian Industry.
- Other government initiatives assist export marketing activities, ensure that major government procurements benefit the Canadian industry and address the industry's human resource issues.

For further information concerning the subject matter contained in these Highlights, please contact:

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